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PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MCS100 E CD Multi-Component Analyser

manufactured by:

SICK MAIHAK GmbH

*Dr Zimmermann Straße 18
88709 Meersburg
Germany*

has been assessed by Sira Certification Service
and for the conditions stated on this certificate complies with:

MCERTS Performance Standards for Continuous Emission Monitoring Systems, Version 2, Revision 1 (April 2003)

Certification Ranges :

CO	0 to 75 mg/m ³
NO	0 to 200 mg/m ³
NO ₂	0 to 80 mg/m ³
CO ₂	0 to 20 %vol
O ₂	0 to 21 %vol

Project No: 674/0192
Certificate No: Sira MC 070099/02
Initial Certification: 05 February 2007
This Certificate Issued: 18 July 2008
Renewal Date: 04 February 2012

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

12 Acorn Industrial Park, Crayford Road, Crayford
Dartford, Kent, UK, DA1 4AL
Tel: 01322 520500 Fax: 01322 520501

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Approved Site Application

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications.

Any potential user should ensure, in consultation with the manufacturer, that the emission monitoring system is suitable for the process on which it will be installed. For general guidance on stack emission monitoring techniques refer to Environment Agency Technical Guidance Note M2: Monitoring of stack emissions to air. This is available on the Agency's website at www.mcerts.net

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Report	Report Number: 936/809002 dated 01/08/91
TÜV Report	Report Number: 936/806018 dated 25/09/96
TÜV Report	Report Number: 936/807013/A dated 08/02/99
TÜV Report	Report Number: Letter dated 10/05/01
TÜV Report	Report Number: 936/808010/B dated 07/01/04

TÜV reports are accepted on the basis of the Environment Agency's document 'MCERTS – Guidance on the acceptance of German type approval test reports for CEMS' Version 2 (October 2003)

Product Certified

The MCS 100 E measuring system consists of the following parts:

- Analyser module
- Heated sampling line
- Sampling probe with heated filter
- Gas cooler

This certificate applies to all instruments fitted with software version 1.38 (serial number N002 onwards).

Certificate No: Sira MC 070099/02
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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +35°C

Unless otherwise stated the evaluation was carried out on the certification range CO 0-75mg/m³, NO 0-200mg/m³, NO₂ 0-80mg/m³, CO₂ 0-20%vol and O₂ 0-21%vol

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Linearity						
CO	0.6					<2%
NO		-1.3				<2%
NO ₂	-0.6		-1.3			<2%
CO ₂						<2%
H ₂ O	<0.04					<0.3%vol
Cross-sensitivity (CO, CO ₂ , NO, NO ₂ , SO ₂ , H ₂ O)						
CO		-0.7				<4%
NO			1.6			<4%
NO ₂			-1.4			<4%
CO ₂				2.3		<4%
H ₂ O	0					<4%
Temperature dependent zero shift						
CO	0.06					<0.3%
NO	0.09					<0.3%
NO ₂	-0.02					<0.3%
CO ₂	0.02					<0.3%
H ₂ O	0					<0.5%

Certificate No: Sira MC 070099/02
This Certificate Issued: 18 July 2008

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AGENCY

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Temperature dependent upper reference point shift						
CO	-0.05					<0.3%
NO	0.06					<0.3%
NO ₂	0.15					<0.3%
CO ₂	0.23					<0.3%
H ₂ O	0.04					<0.5%
Response time						
All gases except O ₂					64 s	<200 s
O ₂					48 s	
Detection Limit						
CO			1.7			<2%
NO			1.6			<2%
NO ₂			1.9			<2%
CO ₂						<2%
H ₂ O	0.1	0.8				<0.2%
Analysis function (field) ^{Note 4}						
CO					99.4%	>95%
NO					99.2%	>95%
NO ₂					99.8%	>95%
CO ₂					99.9%	>95%
H ₂ O					99.9%	>95%
Availability Note 4						
All gases					97.1%	>95%

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ENVIRONMENT
AGENCY

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Zero drift during field trial ^{Note 4}						
CO	0.4					<2%/week
NO	0.5					<2%/week
NO ₂	0.6					<2%/week
CO ₂	0.1					<2%/week
H ₂ O	<0.1					<0.2%/week
Upper reference point drift during field trial ^{Note 4}						
CO	0.4					<4%/week
NO	0.7					<4%/week
NO ₂	0.5					<4%/week
CO ₂	0.4					<4%/week
H ₂ O	<0.1					<0.2%/week
Vibration test (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					Note 1	To be reported
Mains voltage (190V to 250V)	✓					<2%
Sample gas pressure					Note 2	To be reported
Sample gas temperature					Note 3	To be reported
Maintenance Interval ^{Note 4}					6 months	To be reported

Note 1: MCS100 E CD is an extractive analyser. Test not applicable

Note 2: Test not required, as system is an extractive analyse with a pump sampling system.

Note 3: Test not required as no active detection parts are exposed to the flue gas temperature.

Note 4: Field test: The MCS 100 E CD was mounted on a municipal waste incinerator for 3 months. A second field trial was performed over 1 year to extend the maintenance interval to 6 months.

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AGENCY

Description:

The MCS 100 E CD is a multi component gas analyser that uses an extractive process. The analyser system incorporates the MCS100 E IR multi-gas analyser with an integrated sample gas cooler and is used on power plant applications.

The MCS 100 E CD uses an unheated gas pump to draw the flue gas into the measuring system via a heated sample line and a gas cooler. The flue gas is dried in the gas cooler and the use of a cooler permits lower ranges of certain gases in comparison with a hot wet system. NO₂ can be measured without the need for a converter. Water vapour and water soluble gases such as HCl and NH₃ are not measured. Dead time is minimised by the gas throughput being at >400L/h. A dew point measurement corrects any cross-sensitivity resulting from residual moisture.

MCS 100 E CD uses the dual wavelength and the gas filter correlation principle. For the measurement of oxygen within the MCS 100 E CD system a ZrO₂ probe is used.

The ranges on the certificate are the smallest, for other measuring ranges contact the manufacturer for details.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. The Manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC 070099/02.
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.

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